Integrative Reactivation and Rehabilitation to Reduce Multiple Psychiatric Symptoms of Psychogeriatric Patients and Caregiver Burden

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Chapter

General summary

1. Introduction

In psychogeriatric patients who suffer from cognitive impairment or dementia, there is 80% prevalence of two or more psychiatric symptoms; e.g. depression, anxiety, paranoia, aggression. [1 - 4]. Multiple psychiatric symptoms (MPS) have negative effects on cognitive functioning and quality of life. They are a burden for the caregiver; about 70-80% of caregivers is moderately to heavily burdened. Furthermore, MPS predict the patient's admission to a nursing home. [3, 5 - 10] Moreover, these topics are among the top three of problems experienced by dementia patients and their caregivers. [10] In actuality, in usual nursing home care psychotropic drugs are widely used to treat MPS of psychogeriatric patients in spite of limited effects and potentially harmful side effects e.g. (a)typical antipsychotics. [2, 11 - 12] There is a lack of integrative psychotherapeutic programmes even though reports in literature indicate that for individual psychiatric symptoms, e.g. depression, anxiety, psychotherapeutic treatment may be effective. [13 - 18] However, psychotherapeutic interventions focussing on MPS in psychogeriatric patients who suffer from cognitive impairment or dementia are complex due to their multiplicity in combination with cognitive disorders, somatic co-morbidity, and social problems (e.g. relationships, loneliness). [19 - 20]

P.M.: For further literature references see specific chapters.

2. Palliative care in chronic psychogeriatrics; a case study

A case study is presented about the relevance of psycho-social interventions for providing palliative care in the end of life phase of psychogeriatric patients with functional psychiatric co-pathology. The case study describes in detail the psycho-social intervention process as performed in a reactivation unit in a 'psychiatric skilled' Dutch nursing home. The know-how, is highly relevant to tune palliative care to the needs and abilities of the patient. The application of the four main-dimensions of the method of Dynamic System Analysis (particularly Cognitive functions, Psychological functions, Social context and Biology) can stimulate professionals to use an integral perspective both to the psycho-social needs of terminal psychogeriatric patients and their relatives and to the biological aspects. (Bakker, 1997) To establish the value of the DSA method for providing palliative care to psychogeriatric patients with functional psychiatric co-pathology scientific research is recommended to determine the prognostic profile of patients who benefit most from an actual palliative care programme.

3. Psychogeriatric reactivation in an psychiatric-skilled nursing home; a clinical-empirical exploration

The chronic and diverse cognitive function disorders of psychogeriatric patients often occur in conjunction with mood and behavioural disorders (functional-psychiatric pathology), social problems and somatic comorbidity in addition to functional disability (Rubin and Kinscherf, 1989; Teri et al., 1990; Bozzola et al., 1992; Chatterjee et al., 1992; Ballard et al., 1995). [1)] This complex co-pathology suggests that there is a need for specific intervention programmes (Colerick and George, 1986; Steele et al., 1990; McNaughton et al., 1995). The interventions aim at (re) gaining of stabilizing the ability to function autonomously and at enhancing the patients' quality of life (Mortimer et al., 1992; Gray and Fenn, 1993).

It is very important that the outcome of such interventions be measured (Lyons et al., 1997; Bakker and Das, 1996) and that the data is used to identify those patients who benefit most (Rubenstein et al., 1964; Colerick and George, 1986; Narain et al., 1988).

The objective of this study was to identify prognostic characteristics for the probability of discharge of psychogeriatric patients with functional-psychiatric pathology, in order to optimize patient selection for the reactivation programme.

Methods and materials. A retrospective, clinical, empirical study in a Dutch psychiatric nursing home. A group of 102 patients, consecutively enrolled in a psychogeriatric reactivation programme and who met the inclusion and exclusion criteria, was retrospectively examined. The general, functional and diagnostic characteristics were assessed at baseline.

Results. The general characteristics of the reactivation programme patients were not of prognostic value. However, functional characteristics (GDS, HI and ADL score) were prognostically important. In addition, diagnostic characteristics were identified within the following four domains; cognitive function disorder, psychiatric function disorders, caregiver system, and somatic co-morbidity. The prognostic value of the specific diagnostic classification of cognitive function disorders (with the exception of delirium) was irrelevant.

Conclusion. Prognostic modeling, specifically of positive change on severity of multiple psychiatric function disorders of psychogeriatric patients who suffer from cognitive impairment or dementia and on both general burden and competence of caregivers was feasible. The inclusion of a broader range of psychogeriatric patients i.e. lower or higher scores on MMSE and BI, in combination with specific interventions to enhance cognitive functioning, seems justified. Applying three decision rules all resulted in IRR as indicated intervention. Although the performances of the prognostic models found was considered moderate, this strategy is promising. Therefore, designing and conducting a study tailored to timely identifying psychogeriatric patients who likely benefit from an enriched IRR programme is recommended, preferably in a large scale multicentred study comprising a sufficient sample size..

4. Life expectancy following psychogeriatric reactivation

The mortality rate of psychogeriatric patients with cognitive function disorders (e.g. delirium, dementia, Korsakov, amnestic and other cognitive disorders) is higher than that of the normal population (1-3). Apart from the somatic pathology, cognitive dysfunctions often occur in conjunction with psychiatric function disorders, e.g. mood and behavioural disorders (4-8). These disorders are not only related to a decreased quality of life and the need for long-term care, but also to a diminished life-expectancy (9-13). In order to identify patients who may potentially benefit most from specific intensive interventions aimed at reducing the negative effects of the psychiatric function disorders. It is of clinical interest to determine prognostic indicators which may predict survival in these psychogeriatric patients. In order to optimize medical decision making, it is clinical relevant that patients who may benefit form intervention programmes are immediately identified (on admission).

In this clinical-empirical exploration the first objective was to estimate the life expectancy of patients having participated in the psychogeriatric reactivation programme. The second objective was to identify prognosticators of survival on admission.

Participants: Psychogeriatric patients (N=75), suffering from very mild to moderate cognitive function disorders in conjunction with psychiatric function disorders. Intervention: Interdisciplinary reactivation programme.

Measurements: General, functional and diagnostic patient characteristics assessed on admission for the psychogeriatric reactivation programme, and survival rate after discharge over a period of 7 years.

Results: The probability of survival for patients who were discharged from the psychogeriatric reactivation programme to their own homes or to a residential home with restricted support ('independent' group, N=53) was higher (1/HR=3.2) than for patients who were discharged to a nursing home ('dependent' group, N=22). The median survival period of the reference group (community-dwelling elderly people) was 95 months, that of the 'independent' group 35 months and that of the 'dependent' group 13 months. For the reactivated patients (N=75), gender, the Global Deterioration Scale, psychiatric function disorders and somatic comorbidity were of prognostic value. It was possible to account for 32% of the variance in survival after discharge.

Conclusion: The survival rate of the 'independent' group of patients was obviously higher (1/HR=3.2) than that of the 'dependent' group. There was no overlap in 95% CI of the median survival period after discharge. The results suggest that with respect to survival the two groups of psychogeriatric patients who participated in the reactivation programme differed definitely. Additionally, patients belonging to the 'independent' group had a greater chance to benefit form a reactivation programme. The prognostic patient characteristics for survival belonged to five domains (i.e. gender, cognitive function disorders, psychiatric function disorders, somatic comorbidity and caregiver system). The five dimensions are of clinical interest for optimizing the selection of patients who may derive most benefit from

a reactivation programme. The development of a valid prognostic instrument is a prerequisite for optimal medical decision making for such intervention programmes, as is the analysis of cost-effectiveness.

5. Prevalence of psychiatric function disorders in psychogeriatric patients at referral to nursing home care; The relation to cognition, activities of daily living and general details

Systematic research shows that the prevalence of non-cognitive, psychiatric function disorders (PFDs) in psychogeriatric patients staying in a nursing home or home for the elderly percentages varies from 70% to 80%. It is not evident whether and to which degree the PFDs were present at the moment of referral or if the patients had acquired the PFDs during their length of stay in a nursing home or a home for the elderly. Aalten et al. (2003b) reported that of the patients who attended a policlinic for cognitive function disorders, 90% had PFDs. Literature on the prevalence of PFDs in psychogeriatric patients suffering from cognitive function disorders at the moment of referral to nursing home care is rather scarce.

PFDs play an important role in psychogeriatrics. They have negative effects on the quality of life of the psychogeriatric patients and also put a great burden on the caregiver system. In addition, these prognostic factors are important for early admission to an institution (nursing home) as well as for the outcome of psychogeriatric intervention programmes. For assessing psychiatric disorders in psychogeriatric patients Cummings et al. (1994) developed in the 1990s a valid and reliable instrument - the Neuropsychiatric Inventory (NPI). This instrument has already been applied in many studies (Aalten, 2004, 2003; Lyketsos et al., 2001; Wood et al., 2000). A Dutch version has been constructed and validated by Kat et al. (2002).

However, the relation of the PFDs as assessed by the NPI to the hallmarks of psychogeriatric patients - the cognitive function disorders and the related handicaps in activities of daily living (ADL) - is not obvious (Aalten, 2004; Tran et al., 2003). The same implies to relevant general details such as gender, age, marital status, domicile and type of primary caregiver. For the referral of psychogeriatric patients suffering from PFDs to specific intervention programmes it is of clinical interest to optimize the medical decision making process. To that end, insight in the at-referral prevalence and co-occurence of the PFDs and their relation to the cognitive function disorders and ADL handicaps is of relevance, combined with general details.

The objectives of this study were: (1) To estimate the prevalence and co-occurrence of PFDs in psychogeriatric patients suffering from cognitive function disorders at referral to clinical as well as non-clinical (transmural) psychogeriatric programmes; (2) It is expected that PFDs , both total and individual, are positively related to the cognitive function disorders as well as the ADL-handicaps; (3) Exploratively, the structure of the interrelationship of PFDs, cognitive function

disorders and ADL handicaps will be analysed. In addition, the general details and the structure to be identified will be described.

Methods: We studied patients aged ≥ 65 years (N=487), who were suspected to suffer from cognitive function disorders (MMSE ≤ 29) and were referred to trans-/intramural nursing home care in the Nieuwe Waterweg Noord region. General details, i.e. gender, age, marital status, domicile, primary caregiver, as well as PFDs (the Neuropsychiatric Inventory, NPI), cognition (MMSE) and ADL (Barthel Index, BI) were assessed.

Results: Mean score NPI was 3.6 (SD=2.3). Of the patients, 91.7% scored one or more NPI symptom; 81.6% two or more. Depression (43.9%), apathy (43.1%), anxiety (41.6%) and agitation/aggression (31.2%) had a high prevalence. The performance of the logistic regression models for total NPI score with MMSE, BI separately as well as combined with general details was minor. The results of the regression analyses for the individual NPI symptoms showed comparable low R^2 values; the explained a small proportion of the variance. However, in the PRINCALS analysis the MMSE and BI highly correlated with the cognitive dimension, and the NPI with the psychiatric dimension. The model fit was good; 82.6% of the variance was explained.

Conclusion: At the moment of referral to nursing home care, the prevalence and co-occurrence of PFDs was high. The four main NPI symptoms were depression, apathy, anxiety and agitation/aggression. NPI scores (total and per symptom) were relatively independent from MMSE, BI and general details. The PFDs – measured by the NPI – were a dimension on their own. Therefore, in psychogeriatrics it is of clinical relevance to think and act in terms of dimensions. Irrespective of a more rational psychopharmaceutical regime, this opens the door to the regular psychiatric domain for (psycho)therapeutic strategies, e.g. for depression and anxiety adapted to the kind and level of the cognitive function disorder of the psychogeriatric patient.

6. Integrative psychotherapeutic nursing home programme to reduce multiple psychiatric symptoms of psychogeriatric patients and caregiver burden; a randomized controlled trial

Integrative psychotherapeutic programmes in nursing home care have never been tested in large-scale comprehensive studies.[10, 16, 27-30] For these reasons, we developed an integrative psychotherapeutic programme based on a problem-solving theoretical framework, called integrative reactivation and rehabilitation (IRR). In this chapter we reported the results of a RCT designed to test the effectiveness of IRR to reduce MPS in psychogeriatric patients who suffer from cognitive impairment or dementia, and burden of the caregiver. IRR was compared with UC in terms of mean differences on MPS and caregiver burden.

Participants: N = 168 (81 IRR; 87 UC). Patients had to meet DSM IV classification of dementia or amnestic disorders or other cognitive disorders. Additional inclusion criteria: MMSE ≥ 18 and ≤ 27; Barthel Index (BI) ≥5 and ≤ 19; Neuropsychiatric Inventory (NPI) ≥ 3.

Measurements: Primary outcome variable was MPS (NPI). Furthermore, caregiver burden and competence were measured. Assessments: T1 (intake), T2 (end of treatment), T3 (six months follow-up). Cohen's-d (C-d) was computed for mean differences (ITT). For confounding RRM was applied.

Results: From the perspective of the caregiver, in short term IRR showed up to 34% surplus effects on MPS; NPI-symptoms: 1.31 lower (C-d –0.53; P < 0.00) and NPI-sum-severity: 11.16 lower (C-d –0,53; P < 0.00). In follow-up effects sustained. On burden and competence of caregiver IRR showed surplus effects (up to 36%): N-emD: 3.78 (C-d –0.44; P < 0.01) and CB: 17.69 (C-d –0.63; P < 0.00) lower; CCL: 6.26 (C-d 0.61: P < 0.00) higher. In follow-up effects enlarged up to 50%. In RRM results demonstrated to be stable.

Conclusion: From the perspective of the caregiver, the application of IRR, based on person-oriented and problem-solving principles, was significantly two times more effective than usual care in reducing multiple psychiatric symptoms of psychogeriatric patients who suffer from cognitive impairment or dementia. On MPS of the patient, IRR showed a surplus diminishing effect at the end of treatment up to 34 %, and 30 % in six month follow-up. Moreover, IRR had a large positive effect on burden of the caregiver at end of treatment; up to 36%. In long term the surplus diminishing effect on burden of the caregiver even increased up to 50 %, while usual care had no effect at all. Moreover, one may expect that in countries with less well developed psychogeriatric nursing home care than in the Netherlands the surplus effect of IRR will be even substantially larger. This is an important and clinical relevant result, because both problems belong to the top three of experienced problems of dementia patients and their caregivers. Considering all available evidence, we recommend that usual (inter)national psychogeriatric nursing home care and perhaps other forms of care too incorporate integrative psychotherapeutic treatment. The same applies to the education programmes of the various involved disciplines. Future studies have to be performed to strenghten the evidence, preferably as blinded RCTs.

7. Effect modification of integrative psychotherapeutic nursing home programme to reduce multiple psychiatric symptoms of psychogeriatric patients and caregiver burden; a randomized controlled trial

In the previous chapter we reported the results of a RCT designed to test the effectiveness of IRR to reduce MPS in psychogeriatric patients who suffer from cognitive impairment or dementia, and burden of the caregiver.

After all, it is clinically relevant to investigate whether specifically long term effects of IRR were modified by the level of cognitive functioning of the patient at baseline i.e. memory and selfcare and/or by type of dementia i.e. vascular dementia and alzheimer dementia.

The objective of this clinical-empirical study was to identify and estimate, whether long term effects of IRR on the two most relevant outcome variables (severity of the multiple psychiatric symptoms of the patient and general burden of the caregiver) were modified by cognitive functioning (memory and selfcare) and/or by type of dementia (vascular and alzheimer).

Measurements: Primary outcome variable was MPS of the patient assessed by NPI.

Secondary outcome variables were caregiver burden and cognitive functioning. Assessments after intake (T1) and at six months follow-up (T3).

Statistics: Cohen's-d (C-d) was computed for mean differences. To predict long term improvement on MPS and caregiver burden multiple linear regression analysis was applied. As measure of model performance, multiple correlation squared (MR^2) was used.

Results: At six months follow-up, the severity of MPS of psychogeriatric patients showed significant effects with a moderate size in favour of IRR (9.91 lower than in UC). General caregiver burden was 24.76 lower, significantly in favour of IRR. Long term effects of IRR on severity of MPS, as well as on general burden of the caregiver were not significantly modified by level of cognitive functioning or type of dementia.

Conclusion: IRR was an integrative psychotherapeutic nursing home programme based on person-oriented and problem-solving principles. The significant beneficial effects of IRR compared to UC were not modified by level or type of cognitive disorders. This means that beneficial effects of IRR on the severity of multiple psychiatric symptoms of the patient and burden of the caregiver extended to a wide group of psychogeriatric patients who suffer from cognitive impairment or dementia, and their caregivers. Maybe a broader range of patients i.e. (psycho) geriatric patients suffering from a lower level of cognitive functioning and/or different type of cognitive disorder, can benefit from the IRR programme as well. These are important and clinical relevant results, because both topics are among the top three of problems experienced by dementia patients and their caregivers. [10] Considering all available evidence, usual psychogeriatric nursing home care and perhaps other forms of care as well, can now incorporate integrative psychotherapeutic treatment. The same applies to the education programmes of the various disciplines which are involved. Future studies have to be performed to strenghten the evidence, preferably as blinded RCTs.

8. Benefit of integrative psychotherapeutic nursing home programme to reduce multiple psychiatric symptoms of psychogeriatric patients and caregiver burden after six months follow-up; a randomized controlled trial

In this chapter we presented the results of a re-analysis of the effectiveness of IRR in terms of percentages of clinically relevant improved psychogeriatric patients who suffer from cognitive impairment or dementia as well as caregivers. The primary analysis regarded the mean differences between IRR and UC on continuous data of the primary and secondary outcome variables.

After all, it is relevant to estimate the percentages of patients and caregivers who showed clinically relevant improvement in IRR compared to usual care, especially at six months follow-up. Moreover, using an intention to treat (ITT) strategy offers the opportunity to calculate risk ratio's (RRs) and numbers needed to treat (NNTs), which can be compared to those of other interventions.[31, 32] At the end, performing a complete cases analysis (CC) allows a more realistic insight in the efficacy of IRR compared to usual care. Specifically, if there was a relatively high natural dropout, which is a well-known phenomenon in research on frail elderly. [17, 23 - 30] In case of no significant differences between dropouts in both arms of the study, results of a CC-analysis may present a more accurate estimation of the potential benefit of IRR. At the end, only patients and caregivers who fully participated in IRR programme can benefit completely of the offered interventions. In this re-analysis study - following Cummings - minimally, clinically relevant improvement was defined as more than 30 % improvement compared to the baseline value of the primary outcome variable, i.e. NPI-sum-severity. [33, 34] This corresponds well -in this study as well as in general- with a half standard deviation or more of the baseline value. [35, 36] The objective of this clinical-empirical study was to re-analyse the RCT with respect to long term benefit of IRR compared to UC in terms of percentages of clinically relevant improved patients on psychiatric symptoms and of caregivers on burden.

Measurements: Primary outcome variable: change in MPS after six months follow-up with NPI. Secondary outcome variables: Caregiver burden and competence by NPI-emotional distress, Caregiver burden, and Caregiver Competence List. Assessments after intake (T1); after six months follow-up (T3).

Statistics: Intention to treat-analysis on RRs (incl. NNTs) and complete cases analysis (CC) on ORs based on percentages of improved patients and caregivers ($\geq$ 0.5 sd of baseline value).

Results: IRR showed a significant positive effect on NPI-cluster hyperactivity (RR 2.64;

95% CI: 1.26 to 5.53; NNT: 4.07). For psychogeriatric patients who fully completed IRR the results were more pronounced with significant ORs of 2.80 on number of NPI-symptoms and 3.46 on NPI-sum-severity; in IRR up to 76 % patients improved . Regarding caregiver burden, competence of caregiver turned out to be significant beneficial in IRR (RR 2.23; 95% CI: 1.07 to 4.62; NNT 5.07). In complete cases analysis the ORs of percentages of improved caregivers were

significantly in favour of IRR on emotional distress, general burden and competence (range ORs: 2.40 to 4.18) with high percentages of improved caregivers up to 71%.

Conclusion: At six months follow-up IRR showed a significantly higher probability of clinically relevant improvement with a relatively small NNT (four) on multiple psychiatric symptoms in psychogeriatric patients who suffer from cognitive impairment or dementia. The results (76% improved patients) were more pronounced for those who fully completed the IRR programme. The same applies to the higher probability of IRR to improve NPI-related and general burden as well as competence of the caregiver (NNT of five and for those who fully participated 71% improved caregivers). Compared to donepezil, memantine and CBT, the NNTS of IRR were relatively low. Considering all available evidence, usual (inter)national multidisciplinary nursing home care and likely ambulant care programmes are advised to incorporate integrative psychotherapeutic treatment as well as psychiatric strategies. Future studies have to be performed to strenghten the evidence, preferably as blinded RCTs.

9. To identify prognostic factors for a favourable long-term outcome of an integrative psychotherapeutic nursing home programme to reduce multiple psychiatric symptoms of psychogeriatric patients and caregiver burden; a clinical-empirical study

In the previous chapter we explored the differences between IRR and UC on the percentages of clinically relevant improved psychiatric patients who suffer from cognitive impairment or dementia as well as caregivers ; $\geq$ half sd of the baseline value. [33-36] In this chapter the objective was to identify prognostic factors which can predict the likelihood of patients and caregivers to benefit from IRR and which patients from UC. In addition to the identification of these prognostic factors, it is of clinical interest to optimize medical decision making, mainly as decision making is often based on irrational factors. [37-39] In literature many decision rules are considered. [40-43] In this study three decision rules will be applied. The first decision rule (highest Mean Average-rule) is aimed to calculate the average percentage improvement in either intervention. The second rule concerns to minimize the maximum possible loss ('MINIMAX'-rule); this latter rule attempts to avoid the risk of missing benefit by comparing the highest difference between the interventions on each score over all outcome variables; than choose for the intervention with the lowest loss of benefit. The third decision rule concerns the 'MAXIMIN'-rule which implies that the patient will be assigned to the intervention with the lowest level of avoidable risk by comparing the difference between the interventions of the lowest score on all outcome variables.

The objective of the clinical-empirical study was to identify prognostic potentialities of biographic characteristics as well as all baseline variables on five selected

outcome variables. Three of the selected outcome variables showed a significant effect in the RCT i.e. severity of multiple psychiatric symptoms of the patient registrated by the caregiver, general burden and competence of the caregiver. Memory and self-care of the patient were two important background outcome variables. The prognostic potentialities were applied to long term (after six months follow-up). In addition, as the number of outcome variables equaled five, we have explored opportunities for building models to optimize decision making, in which the performances of MEAN AVERAGE, MINIMAX- , and MAXIMIN-decision rules were compared.

Measurements: Primary outcome variable was MPS of the patient. In view of clinically relevant background information of the effect of IRR, burden and competence of the caregiver and cognitive functioning (i.e. memory and self-care) of the patient were selected as secondary outcome variables. Two assessments: T1 (intake) and T3 (six months follow-up).

Statistics: Improvement was defined as a difference of a half sd or more of the baseline value. To identify prognostic potentialities of baseline characteristics logistic regression analysis was applied. To optimize decision making three decision methods were selected from literature and applied.

Results: In the overall combined prognostic models alzheimer dementia showed significant prognostic qualities for improvement on NPI-sum-severity (OR 3.01). The same holds true for IRR on general burden and competence of caregiver (OR 2.29 and 3.34). The prognostic models for NPI-sum-severity as well as competence showed a substantial explained variance (R^2 0.39 respectively 0.23). The others, especially for memory and self-care, were low. In general, the robustness of the prediction models was stable. Applying three decision rules, IRR resulted on five outcome variables as indicated.

Conclusion: Prognostic modeling, specifically of positive change on severity of multiple psychiatric function disorders of psychogeriatric patients who suffer from cognitive impairment or dementia and on both general burden and competence of caregivers was feasible. The inclusion of a broader range of psychogeriatric patients i.e. lower or higher scores on MMSE and BI, in combination with specific interventions to enhance cognitive functioning, seems justified. Applying three decision rules, all resulted in IRR as indicated intervention. Although the performances of the prognostic models found was considered moderate, this strategy is promising. Therefore, designing and conducting a study tailored to timely identifying (psycho)geriatric patients who likely benefit from an enriched IRR programme is recommended, preferably in a large scale multicentred blinded study comprising a sufficient sample size.

10. Economic evaluation of an integrative psychotherapeutic nursing home programme to reduce multiple psychiatric symptoms of psychogeriatric patients and caregiver burden; a randomized controlled trial

Irrespective of beneficial clinical effects it is important to take into account the economic aspects, an economic evaluation.[33-36] In this paper we report the results of an economic evaluation of a RCT in which IRR was compared to usual multidisciplinary nursing home care. The two objectives of this economic evaluation were to assess the cost-utility as well as the cost-effectiveness on six outcome variables of IRR compared to usual care (UC).

Measurements: Primary outcome variable: change in MPS after six months follow-up with NPI. Secondary outcome variables: General burden of the caregiver (CB), competence of caregiver (CCL), cognitive functioning (MMSE), selfcare (BI) and quality of life (EQ5D) of the patient. There were two assessments: after intake (T1) and after six months follow-up (T3). Measurements of costs were conducted every 8 weeks from the moment of inclusion (T0) over the preceding last four weeks (TiC-P). The economic evaluation spans an interval from the start of intervention (T1) up until 40 weeks.

Statistics: Monte Carlo Markov Chain (MCMC) approach to impute the missing values.

The cost-utility was evaluated by relating the difference in direct medical costs per patient receiving either IRR or UC to the difference in terms of Quality Adjusted Life Years gained (QALY), which yielded a cost per QALY estimate.

Complete case analysis (CC) was applied in comparison of the differences in total costs combined with the differences in effects i.e. Incremental Cost-Effectiveness Ratio (ICER).

Results: Applying multiple imputation (MI), at 40 weeks, IRR turned out to be significantly more (cost-)expensive than UC; the costs for IRR were € 4.572,-- (i.e. € 53,-- per day) higher than those for UC (95 % CI: 364.24 to 8797.76). At the same time the number of QALYs was 0.02 lower (non-significant) in IRR (95% CI:-0.10 to 0.05).

So, in the MI analysis after 40 weeks UC could achieve the same amount of QALYs, albeit at significant lower costs. According to the ICER-method IRR was significantly more effective on NPI-sum-severity of the patient (€ 320,-- per point), caregiver burden (€ 130,-- per point) and caregiver competence (€ 540,-- per point). Irrespective of type of intervention improved patients were significantly more (cost-)expensive with respect to NPI-sum-severity of the patient, general burden of the caregiver and competence of the caregiver. Improving seemed inextricably related to more costs, together with relatively high numbers of improved patients and caregivers in IRR. On NPI-sum-severity, general burden and competence of the caregiver comprised after six month follow-up clearly more significantly improved patients and caregivers than UC.

Conclusion: On QALYs, no significant differences were found, while total medical costs of psychogeriatric patients in IRR were significantly higher. In contrast, fully participating patients and their caregivers improved in IRR significantly more on mean scores of the primary outcome variable i.e. severity of multiple psychiatric symptoms of the patient and of the secondary outcome variables i.e. general caregiver burden and competence of the caregiver, with ICERS varying from

€ 130.-- to € 540.--. The large discrepancy between QALYs and ICERs found in this study on psychogeriatric patients may mean a drawback in cost-utility studies in psychogeriatrics. It demands further research on validation of EQ5D in intervention studies with psychogeriatric patients. Considering all available evidence, the surplus costs of IRR may be considered acceptable when the beneficial effects were taken into account on the high societal costs of suffering from multiple psychiatric symptoms of psychogeriatric patients and high burden of caregivers.To optimize the cost-utility and cost-effectiveness of IRR, the construction of a tool enabling to identify suitable psychogeriatric patients and caregivers for IRR is of high economical and clinical interest. Such a tool would contribute to optimize medical decision making based on an economical evaluation.

11. General summary

In this dissertation the (cost-)effectiveness is tested of an integrative psychotherapeutic nursing home programme (IRR) to reduce multiple psychiatric symptoms of psychogeriatric patients who suffer from cognitive impairment or dementia as well as burden of caregivers. From the perspective of the caregiver, IRR showed a two times larger mean reduction on number and severity of psychiatric symptoms of psychogeriatric patients than usual nursing home care; actually up to 61% reduction after six months follow up. Of the patients who fully completed the IRR programme up to 76% improved 30% or more compared to their scores at baseline. In addition, mean burden of caregivers reduced up to 50% after six months follow-up, while usual care had no effect at all. Of the caregivers who fully completed the IRR programme up to 71% improved 30% or more compared to their scores at baseline. The surplus total costs for improvement were relatively low i.e. € 53,-- per day (about half of a CVA-unit: € 102,--). As in psychogeriatric patients who suffer from cognitive impairment or dementia the prevalence of two or more psychiatric symptoms is 80% and 70-80% of caregivers are moderately to heavily overburdened, implementation of integrative psychotherapeutic treatment in multidisciplinary usual nursing home care for psychogeriatric patients should be facilitated. In addition, future studies have to be performed to strengthen the evidence, preferably as blinded RCTs with a long follow-up period.

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P.M.: For further literature references see specific chapters.